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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/685,867	10/14/2003	Horst Haussecker	070702008320	6650

7590 02/28/2007  
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EXAMINER
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LE, BRIAN Q

ART UNIT	PAPER NUMBER
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2624

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/28/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/685,867	<b>Applicant(s)</b> HAUSSECKER ET AL.	
	<b>Examiner</b> Brian Q. Le	<b>Art Unit</b> 2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 12 December 2006.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-7,12,13,24-26,28 and 29 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-2, 4-7, 12-13, 24-26 and 28-29 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **Response to Amendment and Arguments**

1. Applicant's amendment filed December 12, 2006, has been entered and made of record.
2. Applicant's arguments with regard to claims 1-2, 4-7, 12-13, 24-26 and 28-29 have been fully considered, but are not considered persuasive because of the following reasons:

Regarding claim 1, the Applicant argues (page 5 of the Remarks) that both the cited references (Kley U.S. Patent No. 6,396,054 and Aksay et al. U.S. Pub. No. 2001/0023024) do not disclose "a biomolecule" and relate to molecular combining of a biomolecule wherein the molecular combining comprises attachment of the biomolecule to a surface and alignment of the biomolecule. The Examiner respectfully disagrees. Aksay teaches a concept of a biomolecule (page 5, column 1, [0055]) which also well known in the art (page 1, column 1 [0004]) wherein the molecular combining comprises attachment of the biomolecule to a surface (abstract, first 10 lines) and alignment of the biomolecule (the alignment of nanostructures which disclosed by Aksay can be biomolecule) (page 2, column 2, [0023]; page 3, column 2, [0036]).

Thus, the rejections of all of the claims are maintained.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-2, 4-6, and 12-13, 24-26 and 28-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Kley U.S. Patent No. 6,396,054 and Aksay et al. U.S. Pub. No. 2001/0023024.

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Regarding claim 1, Kley teaches a method comprising:

a) alignment an object on a surface by molecular combing (column 16, lines 50-60 where object is positioning on the x,y plane (aligning object) on a surface (diamond coated surface) (column 16, lines 15-20) by molecular combing (column 17));

b) imaging the object by at least two different modalities (different modes) of scanning probe microscopy (SPM) (column 2, lines 24-28) to obtain data for one or more properties of the object (metric measurements) (column 2, lines 50-51);

c) analyzing the data using a model-based analysis using one or more models of physical structures of known objects (topography) (column 4, lines 63-67);

c) estimating the values of one or more parameters from the data analysis (AFM and STM measurements) (column 10, lines 15-16); and

d) fusing the estimated parameters to form one ore more fused parameters comprising a parameter-based characterization of the object (column 19, lines 20-50).

However, Kley does not explicitly disclose wherein an object can be a biomolecule and aligning a biomolecule in a parallel manner on a surface. Aksay teaches a method wherein an object can be a biomolecule (page 5, column 1, [0055]); aligning a biomolecule in a parallel manner on a surface (FIG. 9.; page 3, column 2, [0036]; and page 5, [0060]) and wherein the molecular combining comprises attachment of the biomolecule to a surface (abstract, first 10 lines) and alignment of the biomolecule (the alignment of nanostructures which disclosed by Aksay can be biomolecule) (page 2, column 2, [0023]; page 3, column 2, [0036]). Modifying Kley according to Aksay would be able to align biomolecule in parallel so that microscopic grain boundaries can be clearly imaged and distinct from one another (page 5, [0063]). This would

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improve processing and therefore, it would have been obvious to one of the ordinary skill in the art to modify Kley according to Aksay.

For claim 2, Kley teaches the method of claim 1, wherein parameter fusion is based on the model of the physical structure (gathering data/producing data) (column 19, lines 20-50).

Regarding claim 4, as disclosed in claim 1, Aksay also teaches the method further comprising identifying the biomolecule (forms patterns/structures of biomolecule) (page 8, column 1, [0080]).

For claim 5, as disclosed in claim 1, Kley discloses the method further comprising comparing the fused parameters with parameters determined from known biomolecule (as disclosed in claim 1) to identify an occurrence of a known biomolecule (topography)(column 4, lines 65-67).

Regarding claim 6, Kley (as discussed in claim 1) teaches the SPM imaging includes at least two modalities selected from the group consisting of scanning tunneling microscopy (STM) (column 2, lines 24-37).

For claim 12, as disclosed in claim 1, Kley also teaches the method further comprising known biomolecule structures to obtain ranges of parameters for each type of biomolecule (column 13, lines 60-67).

Regarding claim 13, as disclosed in claim 1, Kley further teaches the method wherein the parameter ranges for known biomolecules are used in estimating the parameters (column 14, lines 25-32).

For claim 24, please refer back to claim 1 for teachings and explanations. In addition, Kley further teaches controller (FIG. 26, "controller", element 114) to control the operation of

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the scanning probe microscope, memory (FIG. 26, “memory”, element 124) to include one or more characterizations of known structures, and a surface for attachment (column 16, lines 15-20).

For claim 25, please refer back claim 5 for the teachings and explanations.

Regarding claim 26, Kley discloses the system wherein the characterizations of known structures are used to analyze a set of SPM images (column 4, lines 63-67 through column 5, 5-16).

For claim 28, please refer back to claim 5 for the teachings and explanations.

For claim 29, please refer to claim 1 for teachings and explanations. In addition, Kley further teaches step of analyzing images and reanalyzing the data (column 4, lines 63-67; column 7, lines 5-10; column 11, lines 60-67).

5. Claims 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Kley U.S. Patent No. 6,396,054 and Aksay et al. U.S. Pub. No. 2001/0023024, as applied to claims 1 and 8 above, and further in view of Grand et al. “Epitaxial growth of copper phthalocyanine monolayers on Ag(111)”, Surface Science, vol. 366, no. 3, 1 November 1996.

Regarding claim 8, Kley does not explicitly teach the method wherein the parameters are estimated by level set techniques, PDE (partial differential equation) techniques. Grand teaches the method wherein the parameters are estimated by level set techniques, PDE (partial differential equation) techniques (page 404, column 1, 3<sup>rd</sup> paragraph). Modifying Kley’s method of utilizing scanning probe microscopy according to Grand would be able to use partial differential equation as an estimation tool in estimating parameters. This would improve processing and

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therefore, it would have been obvious to one of the ordinary skill in the art to modify Kley according to Grand.

For claim 9, Grand also teaches a method further comprising embedding the techniques in a probabilistic estimation framework (Page 405, column 1, last 15 lines and page 406, column 1, 1<sup>st</sup> 15 lines).

Regarding claim 10, Grand teaches the method further comprising classifying the subject by applying vector quantization, support vector machines (FIG. 7). Modifying Kley's method of utilizing scanning probe microscopy according to Grand would be able to further classify fused parameter. This would improve processing and therefore, it would have been obvious to one of the ordinary skill in the art to modify Kley according to Grand.

Referring claim 11, Grand teaches the method further comprising using known biomolecule structures to generate training sets of data (page 405, 1<sup>st</sup> column, last 10 lines).

### ***Conclusion***

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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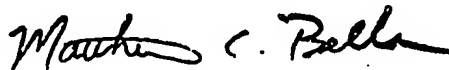
however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

**Contact Information**

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian Q. Le whose telephone number is 571-272-7424. The examiner can normally be reached on 8:30 A.M - 5:30 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mathew Bella can be reached on 571-272-7778. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



BL  
February 23, 2007

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